

## **A Study of Management and its Reliability Attributes**

**Tripti Singh<sup>1</sup>, G. P. Chhalotra<sup>2</sup>, Neena Chhalotra<sup>3</sup>, Manisha Chhalotra<sup>4</sup>,  
Rishi Chhalotra<sup>5</sup>, Rajesh Patidar<sup>6</sup>, Ankan Mahant<sup>7</sup> and Jignesh Singhvi<sup>8</sup>**

<sup>1</sup>Indian Institute of Forest Management  
Nehru Nagar Bhopal, M. P., INDIA.

<sup>2</sup>Retd., Prof.,  
EE, Govt. Engg. College of M. P., INDIA.

<sup>3</sup>IT Engineer Specialist, Atlanta, U.S.A.

<sup>4</sup>Atherwa College of Management,  
Mumbai, M.S., INDIA.

<sup>5</sup>Computer Engineer,  
Oracle Corporation, Atlanta, U.S.A.

<sup>6</sup>Computer Engineer,  
Opennet Atlanta U.S.A

<sup>7</sup>Shri Govindram Seksaria Institute of Technology & Science  
23, Park Road, Indore, M.P. INDIA

<sup>8</sup>Business Analyst  
NSE - IT, Mumbai, M.S., INDIA

(Received on: 12 April, 2014)

### **ABSTRACT**

Many Researches, Writers and Managers discuss about the management but rarely think about the dynamics of management. Most Engineers rarely bother for a deep knowledge of the organisation, management, Administration, Leadership and Motivation phenomena. In this article the authors have made attempts to segregate them from the organisation, one can say boldly that organisation has attributes such as Management, Administration, Leadership and Motivation. One can get a grand success in an Economic system, if tries to understand the valuable parameters of dynamic economic system. In a dynamic economic system the organisation Management, Administration, Leadership and Motivation must be dynamic otherwise the failures of the system are faced bitterly.

One must study the failures of the above five attributes of a system, where input and outputs realized. The law of diminishing returns is applied to all types of system where natural failure rates are predominating, one must boost up the system to run it with time and dynamics of motion.

New definitions are derived for organisation, management, administration, leadership and motivation. A factory can produce profits only where these five attributes are brought to our knowledge as

crystallize clear. Thanks to the Fuzzy Logic and neural systems that give us path to solve long pending vague problems, one must be a complete solution and no part of a problem. Reliability can give risky, hazard, danger, calamity, disaster and failures, security, alertness, safety and fearlessness are derived from these attributes which are necessary factors in the modern society.

**Keywords:** Dynamics of management, leadership in management.

## INTRODUCTION

In every day life people talk and discuss about management but rarely bother for its reliability attributes. Management has four functions planning, scheduling, forecasting and controlling. Management is a flow of organisation or it's a rate of change of organisation. Organisation is group of persons who have co-operation, Co-ordination, synchronism and mutual coupling. Their organs are synchronized they have common Psychology and hobbies. They have same language, dresses, eating, living, behaviour, talking, relations and affectionate to each other.

## 1. Organisation

If organisation is not formed properly the failure of the objective will occur and management will also fail. Further to the management, there is administration which is the flow of the management. The administration is the rate of change of the management. The rate of change of management is the administration and it may be dynamic management and state type of management. The rate of change of the administration is the leadership and rate of change of leadership would be motivation. One can develop a mathematical model out of this narrative modeling. If X is designated as organisation the, Space I is alert in these conditions:

### Space – I

X	organisation (Charge)	organisation	0.912
$\frac{dx}{dt}$	Management (Velocity)	Management	0.886
$\frac{d^2x}{dt^2}$	Administration (Acceleration)	Administration	0.892
$\frac{d^3x}{dt^3}$	Leader ship	Leader ship	0.926
$\frac{d^4x}{dt^4}$	Motivation	Motivation	0.966

### Space- II

$$a \frac{d^4x}{dt^4} + b \frac{d^3x}{dt^3} + c \frac{d^2x}{dt^2} + d \frac{dx}{dt} + e x \Rightarrow \text{Input} \Rightarrow \text{Force}$$

		$\mu A(\lambda)$	$\lambda$	$\lambda R$	Sec	T
a.	Motivation factor	0.912	.0921	.084	.916	10.86
b.	Leadership factor	0.927	.0758	.702	.929	13.1926
c.	Administration factor	0.896	.1098	.0984	.9016	9.1074
d.	Management Factor	0.886	.1213	.10723	.89276	8.262
e.	Organisation factor	0.779	.2497	.1943	.803	4.048

The well known three constants are defined in the dynamic as Inertia constant, damping constant and controlling constant. One can define the coefficient of motivation and the coefficient of leadership, in the sequential way. The a, b, c, d, and e have a failure rate, as given in the Fuzzy space. The Fuzzy cardinality of such an organisation may be-

$$|A| = \int_{i=1}^x \mu A(\lambda) d\lambda = 4.4 \text{ and Reliability} \quad (1)$$

$$R = \frac{1}{n} \int_{i=1}^x \mu A(\lambda) d\lambda = 0.88 \text{ and}$$

$$\lambda = .127983 \text{ at MTBF} = 7.822278$$

## 2. Types of management

There are large number be management schemes-

### Space-III

Fuzzy	$\mu A(\lambda)$	$\lambda$	$\lambda R$	Sec	T
Informal management	0.552	.5942	.328	.672	2.469
Formal Management	0.667	.405	.2701	.7299	2.469
Conventional manage.	0.886	.12103	.1072	.892	8.26
Non conventional management	0.776	.2536	.1968	.8032	3.943
Functional manage.	0.912	.9214	.084	.916	10.857
Line management	0.906	.0987	.0894	.910	10.1317
Staff management	0.889	.1176	.1045	.8954	8.5
Objective type of management	0.926	.07688	.07119	.9288	13.07
Primitive management	0.779	.2497	.1945	.8054	4.00
Home management	0.996	.004	.003992	.996	25
State management	0.796	.228	.1816	.8184	4.38
National management	0.896	.1098	.0984	.9016	9.107
International management	0.912	.0921	.0840	.91599	10.85
Strategic management	0.892	.1142	.1019	.898	8.75

Fourteen types of managements are tested in the space III. One can find the failure rate, differentiation of the organisations. One can find the reliability of the management using Fuzzy space III One can find the Fuzzy humming distance.

$$||A|| = \frac{1}{n} \int_{i=1}^x \mu A(\lambda) d\lambda = 0.8417857 \quad (2)$$

$$\text{and } \lambda = .1722276 \text{ at MTBF} = 5.86627$$

## 3. Organisational Function

The organisation plays a vital role in the production of a factory and a concern. The organisation of a system must be well according to the requirements of co-operation co-

ordination, synchronism and mutual coupling among the elements. If  $e_1, e_2, e_3, \dots, e_i$  are the elements then one can simulate the organisation by system in Fig. 1

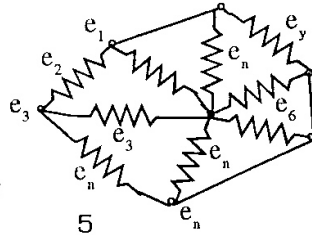


Fig1: System

The system may be called an organisation represented a coupled matrix with elements:

$$[n] \Rightarrow \begin{bmatrix} e_{11} & e_{12} & e_{13} & e_{14} & \dots & e_{1n} \\ e_{21} & e_{22} & e_{23} & e_{24} & \dots & e_{2n} \\ e_{31} & e_{32} & e_{33} & e_{34} & \dots & e_{3n} \\ e_{41} & e_{42} & e_{43} & e_{44} & \dots & e_{4n} \\ \vdots & \vdots & \vdots & \vdots & \ddots & \vdots \\ e_{n1} & e_{n2} & e_{n3} & e_{n4} & \dots & e_{nn} \end{bmatrix} \Rightarrow \text{Vector space (3)}$$

The system can be represented by a matrix, circuit, set, space, vector space, efficiency, transfer function, transformation, and co-ordination. The event and activities in system can be simulated using PERT and CMP methods. Large number of methods are used to simulate a system or organisation to find reliability Fig. 2 and Fig. 3 show network simulation of organisation, management, administration, leadership and motivation.

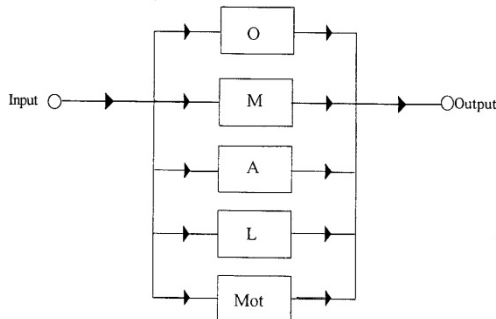


Fig. 2 Paralled Analogue of organisation management administration, leadership and motivation.



Fig. 3 series Analogue of organisation, management administration leadership and motivation.

The Series and parallel working will govern the reliability. The efficiency of the organisation may be denoted in Fig. 4 which by the ratio of output to input.

Fig. 4 Efficiency of system.

One can write with basic principles that:

$$\text{Out put} = O = I \quad (4)$$

The efficiency will depend on the co-operation, co-ordination, synchronism and mutual couplings. The mutual coupling may be negative also. The negative modes of co-operation and co-ordination are found using human relations.

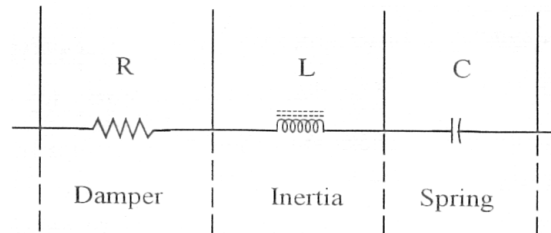


Fig. 5 RLC circuit represent Management, Administration, and Organisation.

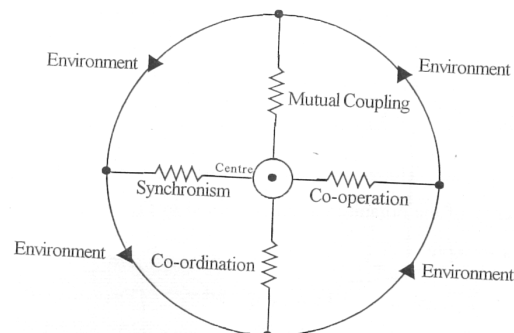


Fig. 6 the Centre of the system maintains synchronism, co-ordination, co-operation and mutual coupling with Environment or the society.

Fig. 5 represent RLC analogue of organisation management and administration. The resistance is a damper break. obstacle and retardation to the activity (current). The L and C are the state variables. The current in inductance is a state variable. The voltage across capacitance is also a state variable.

Fig. 6 is a Schematic representation of co-ordination, co-operation, synchronism and mutual coupling of environment to the centre and element to element. The element hood or Fuzzy logic membership function can be obtained. These are called Fuzzy grades of truth, for element hood.

#### Space – IV

Fuzzy	$\mu A(\lambda)$	$\lambda$	$\lambda R$	Sec	MTBF
Environment	.912	.0921	.084	.916	10.857
Society	0.926	.0768	.07119	.928	13.020
Synchronism	0.886	.12103	.1072	.892	8.26
Co-ordination	0.776	.2536	.1967	.8032	3.9432
Co-operation	0.668	.40346	.2695	.730	2.4785
Mutual coupling	0.562	.5762	.3238	.6761	1.7355
Elements	0.882	.1255	.11074	.889	7.9687
Parallel working	0.916	.08773	.08036	.9196	11.398
Series working	.526	.6424	.3379	.6621	1.556
Fuzzy working	0.892	.1142	.1019	.898	8.756
System	0.926	.0768	.07119	.92881	13.0208
Organisation	0.891	.1154	.1028	.8971	8.665
Management	0.912	.0921	.084	.916	10.85776
Administration	0.887	.1199	.1063	.8936	8.3402
Leadership	0.912	.0921	.084	.91599	10.857
Motivation	0.962	.0387	.0372	.9627	25.839

#### Space – V

Fuzzy	$\mu A(\lambda)$	$\lambda$	$\lambda R$	Sec	MTBF	Adequacy
Strategic	.776	.2536	.1967	.8032	3.943	.886
Decision	.886	.12103	.10723	.8927	8.2624	.776
Planning	.912	.0921	.084	.916	10.857	0.912
Scheduling	0.896	.1098	.0984	.9016	9.1074	0.896
Forecasting	0.556	.5869	.3263	.6736	1.70386	0.779
Controlling	0.826	.191156	.1578	.8421	5.2313	0.662
Working	0.917	0.866	.0794	.9205	11.547	0.899
Activities	0.886	.121036	.1072	.8927	8.262	0.777
Events	0.926	.07688	.07119	.9288	13.0072	0.679
Work done	.876	.13238	.11597	.884	7.554	0.892

One can find Fuzzy cardinality of Space IV as follows:

$$|A| = \int_{i=1}^x \mu A(\lambda) d\lambda = 13.436$$

$$\|A\| = \frac{1}{n} \int_{i=1}^x \mu A(\lambda) d\lambda = 0.83975$$

$$\text{and } \lambda = .1746488$$

#### 4. Mutual coupling of organisation management and administration

There should be good coupling among the organisation management and administration which can be found Fuzzy logic network. The system may be resolved into components or it can be transformed to a new system.

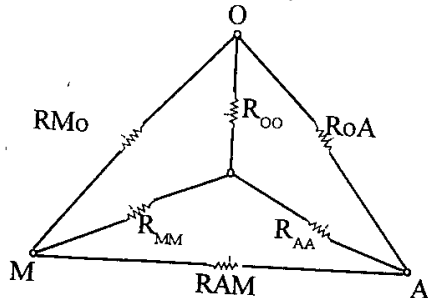


Fig. 7 Mutual coupling among organisation, Management and Administration.

The reliability of the system may be found using mutual coupling and self coupling of organisation, management and administration it can form a matrix of a system as follows:

(6)

These are called Fuzzy logic membership functions. The mutual coupling is 50% membership function in Fuzzy space. If  $R$  is the self Fuzzy grade of truth and  $R_m$  the mutual Fuzzy grade of truth them:

$$R_1 = R - R_m \quad R_2 = R - R_m, \quad R_0 = R + 2R_m$$

$$R_1 = 0.5, \quad R_2 = 0.5 \text{ and } R_0 = 2$$

One can simulate this equation in Fig. 8

(7)

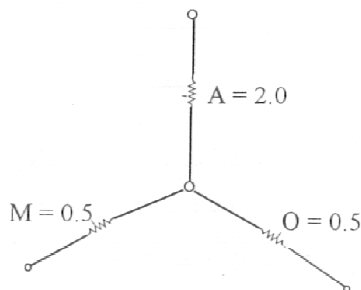


Fig. 8 Model network.

Where there is no mutual coupling among the O, M, and A the three independent vectors can be found as the orthogonal matrix.

(8)

If the organisation has a magnitude 0.5 and management mode is also 0.5, then. The administration is 2 times to the reference and four times to the organisation mode resolved into components. The model organisation, management and administration are independent without any mutual coupling or very weak coupling. The three are de-coupled in a system to increase administration four times.

#### 5. Management Triangle

The management is simulated by a triangle the work load has an area equivalent. The decision making is made at the planning level and very few personnel are required. The work is simple but hard to decide about the new planning. This is at the strategic planning. Scheduling and forecasting managers are also important to notify the plan and extend it at large level and details are enlarged for controlling workers. One can find the reliability of the system using Fuzzy logic noting their failure rates.

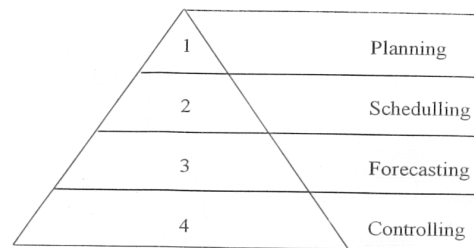


Fig. 9 Management triangle

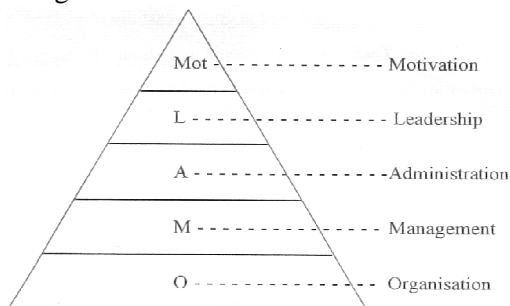
The space  $V$  has a Fuzzy cardinality 8.457 and relative Fuzzy cardinality 0.8457 at the failure rate  $\lambda = .1675884$  and MTBF = 5.967.

Accurate failure rate can be calculated for the elements. Failure rate are always found how so ever the system works. The Fuzzy grades of truth are assigned on the own logic basis and inference and decision is taken on the ground of experience and the antecedent events. The reliability of the management triangle may be 84.57 % and MTBF 5.967 years.

It would be about 6 years. The system of management formed would prolong for six years of period.

## 6. Triangle of Five Attributes

Organisation has many people to work they may be 1000 management may have less workers as 100. Administration may have 10 persons. Leaders may be 5 persons. The motivation may be in 2 persons or only 1 person. The triangle can simulate O, M, A, L and not without leadership of positive nature, the system cannot rise. Without motivation nothing can be done. The triangle may be read from up side to down as decision, planning, fore casting, scheduling, controlling, working, existing etc.



**Fig. 10 System Triangle with O, M, A, L and Mot. Attributes.**

These five attributes are obtained by proper training to the engineers. There is a shortage of leadership and motivation in the engineering works factories, industries, collars, schools firms etc. Leaders and motivators are borne naturally, but can be trained.

## 7. Motomotive Force

The work is done under the forces of motivation which has greatest intensity, density and effectiveness. The leader ship shows how to work and leads in the engineering work, skill, intelligence, simulation fabrication. Will, wishes, demand, need, necessarily, urgency, trembles, difficulties, task etc. may promote motivation. Leader takes a risk to lead and work in new manner new methods. New ideas, Administrator is always busy to work what is assigned, to other persons. The assignment must be completed at any conditions.

Administrator extract work from workers and management system. There is a need to open posts of motivators and leaders in the industries to motivate people and lead them successfully in place of managers and administrators. These are old systems and should be stopped. The British system of leadership and motivation should be started. All failures are due to managers and administrators.

## DISCUSSION

Dynamics of organisation are called the management and administration. First of all the organisation should be formed. The organisation is formed only when the elements or units co-operations, co-ordination, synchronism and mutual coupling of positive type. The managers and administrator may apply some of the negative coefficients to counter balance the excess forces and work. The errors are eliminated by administrators can do more work then informal management. Management is systematic methods working. Scientific management is powerful when all things are tested in the laboratory. Every organisation must have a laboratory to test the things of input and output.

Reliability varies with time and the motion. One should bother for time decay as well as space decay. Organisation management,

administration, leadership and motivation have time and space failure rates and they do not remain the same for a long time. Reliability is unity at zero time and 50% after 5 years of period. It is zero after 10 years of time.

It is realized that human system must have innovation and updating, otherwise worn out system will give zero output, even negative output is found. Reliability is the aspect which one want for the comforts and money. The risk, hazard, danger, calamity and disasters are the results of failure rate. Every system has a life, eventually it dies.

## REFERENCES

1. Tarachand. Engineering Economics Roorkee University" S. Chand and Company 1960 [Book].
2. G.P. Chhalotra. "Elerctrical Engineering Economics" Khanna Publishers 2, Nath Market, Nai Sardk, Delhi 1988 [Book]
3. G.P. Chhalotra *et al.* Reliabilityh attributes of project management and administration under dynamic Economic system" Proceedings of the national seminar on project Management NSMP, 95, 23-24 December, a 995 The Institution of Engineers, India, Palakkad Kerla PP. 216-223.
4. G.P. Chhalotra. "Reliability Engineering and Applications" Khanna Publishers Delhi, 1986 [Book]
5. AMSE France. "Association for the advancement of modelling and simulation Techniques of Enterprises" 16 AV Grange Blance, 69160 Tassin La' Delhi-Lune, France 2002 1C.
6. Ghazala Mumtaz Molizk. "Reliability of computers and their management" Ph.D, Thesis, Jan.10, 2000 Guru Ghasidas University, Bilaspur.
7. Satish Mittal. "The ticket to your organisation success" knowledge integration. The Journal of the Information technology, Sept. 2001, Vol. 10, N, 11, Barton Centre M.G. Road, Bangalore.
8. G.P. Chhalotra. "Advanced Electrical Technolgy" Khanna Publishers Delhi 1977 [Book] computer simulation of dynamic systems.
9. G.P. Chhalotra and Sourabha Rungta. "Study of creativity and Innovation of Enterprises Proceedings of National seminar on creativity and Innovation for Entrepreneurial Development December 1 and 2, 2001 Raipur Institute of Technology Raipur.
10. G.P. Chhalotra, *et al.* "Study of reliability attributes of General system model of firm under CBIS and MIS using Fuzzy logic" International conference on Energy Automation and Information Technology IIT Kharagpur December 9-11, 2001 proceedings PP. 884-888.